

CLAIMS

1. A method for cultivating eukaryotic microorganisms, in particular algae, microalgae or blue algae, wherein
 - a perforated support (14) comprising a first major surface (19) and a second major surface (22) is provided, wherein the support (14) comprises a web material and is essentially impermeable to eukaryotic microorganisms (20) or to blue algae,
 - the eukaryotic microorganisms (20) or the blue algae are applied to the first major surface (19) where they remain immobilized and from which they are adapted to be removed,
 - an aqueous solution (18) flows along the first major surface (22),
 - a portion of the flowing aqueous solution (18) is essentially transported by capillary forces from the second major surface (22) through the support (14) to the first major surface (19),
 - whereby the first major surface (19) is supplied with aqueous solution (18), and
 - wherein the applied eukaryotic microorganisms (20) or blue algae grow on the first major surface (19).
2. The method according to claim 1, wherein the layer produced by the aqueous solution (18) contains a distribution layer (23) distributing the aqueous solution (18) across the second major surface (22) of the or each perforated support (14,16).

3. The method according to claim 2, wherein the distribution layer (23) is a non-woven material in particular of glass or plastic fibers, and in particular a geotextile.
4. The method according to claim 1, wherein the perforated support (14), the further perforated support (16) and/or the distribution layer (23), if present, is/are hydrophilic.
5. The method according to claim 1, wherein the perforated support (14), the further perforated support (16) and/or the distribution layer (23), if present, comprise mineral fibers, hydrophilic organic fibers, in particular organic or inorganic materials, or combinations thereof.
6. The method according to claim 1, characterized in that
 - a further support (10) comprising a first major surface (19) and a second surface (22) is provided, wherein the further support (10) also comprises a web material and is essentially impermeable to eukaryotic microorganisms (20) or blue algae, and the eukaryotic microorganisms (20) or the blue algae are applied to the first major surface (19) of the further support (10) and remain there removably immobilized,
 - both supports (10) have their second major surfaces (22) facing each other and arranged essentially in parallel to each other, and
 - the aqueous solution is introduced between the second major surfaces (22) of the two supports (10) and flows between said major surfaces (22) in contact with the second surfaces (22).

7. The method according to claim 1, wherein, after cultivation, the eukaryotic microorganisms (20) or the blue algae are removed from the perforated support (14) and/or the further perforated support (16) by application of mechanical forces, e.g. scraping, or chemical treatment, e.g. treatment with surface-active agents and/or organic solvents, the eukaryotic microorganisms (20) or the blue algae are harvested together with the perforated support (14), the eukaryotic microorganisms (20) or the blue algae are harvested by collection of removed biomass in flowing culture medium, and/or wherein the eukaryotic microorganisms (20) or the blue algae separate from the porous support (14) after drying and are collected.
8. A device for cultivating eukaryotic microorganisms, in particular algae, microalgae or blue algae, comprising
 - a perforated support (14) comprising a first major surface (19) and a second major surface (22) opposite said first major surface (19),
 - wherein the eukaryotic microorganisms (20) or the blue algae are adapted to be cultivated on the first major surface (19) of the perforated support (14), and the perforated support (14) is essentially impermeable to the eukaryotic microorganisms (20) or the blue algae to be cultivated, and
 - a film comprising an aqueous solution (18), said film merely being in contact with the second major surface (22) of the support (14) and flowing along the second major surfaces (22),
 - wherein the aqueous solution (18) is adapted to be transported by capillary forces from the second major surface (22) through the perforated support (14) to the first major surface (19).

9. The device according to claim 8, characterized by a further perforated support (16) comprising a first major surface (19) and a second major surface (22) opposite said first major surface (19),
 - wherein eukaryotic microorganisms (20) or blue algae are adapted to be cultivated on the first major surface of the further perforated support (16), and the further perforated support (16) is essentially impermeable to the eukaryotic microorganisms (20) or the blue algae to be cultivated, and
 - wherein the second major surfaces (22) of both supports (14,16) face each other and are spaced from each other by the film comprising the aqueous solution (18).
10. The device according to claim 8, characterized in that a distribution layer (23) distributing the aqueous solution (18) across the second major surface (22) of the or each perforated support (14,16) is located in the film produced by the aqueous solution (18).
11. The device according to claim 10, characterized in that the distribution layer (23) is a non-woven material in particular of glass or plastic fibers, and in particular a geotextile.

12. A biosensor with eukaryotic microorganisms, in particular algae, microalgae or blue algae, comprising

- a perforated support (14) comprising a first major surface (19) and a second major surface (22) opposite said first major surface (19),
- wherein the eukaryotic microorganisms (20) or the blue algae are adapted to be immobilizedly cultivated on the first major surface (19) of the perforated support (14), and the perforated support (14) is essentially impermeable to the eukaryotic microorganisms (20) or the blue algae to be cultivated, and
- a film comprising an aqueous solution (18) which is merely in contact with the second major surface (22) of the support (14) and flows across said second major surface (22),
- wherein the aqueous solution (18) is adapted to be transported by capillary forces from the second major surface (22) through the perforated support (14) to the first major surface (19), and
- wherein the cultivation takes place in dependence on the composition of the aqueous solution and/or a fluid being in contact with the first major surface (19) of the perforated support (14) and/or the eukaryotic microorganisms (20) or the blue algae.

13. The biosensor according to claim 12, characterized by a further perforated support (16) comprising a first major surface (19) and a second major surface (22) opposite said first major surface (19),
 - wherein eukaryotic microorganisms (20) or blue algae are adapted to be cultivated on the first major surface (19) of the further perforated support (16), and the further perforated support (16) is essentially impermeable to the eukaryotic microorganisms (20) or the blue algae to be cultivated, and
 - wherein the second major surfaces (22) of both supports (14,16) face each other and are spaced from each other by the film produced by the aqueous solution (18).
14. The biosensor according to claim 12, characterized in that a distribution layer (23) distributing the aqueous solution (18) across the second major surface (22) of the or each perforated support (14,16) is located in the film comprising the aqueous solution (18).
15. The biosensor according to claim 14, characterized in that the distribution layer (23) is a non-woven material in particular of glass or plastic fibers, and in particular a geotextile.
16. The biosensor according to claim 12, characterized in that the aqueous solution (18) comprises a nutrient solution for the eukaryotic microorganisms (20) or the blue algae.
17. The biosensor according to claim 12, characterized in that the or each perforated support (14,16) and, if present, the distribution layer (23) is/are hydrophilic.